

## Examiner's Detailed Office Action



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### UNITED STATES PATENT AND TRADEMARK OFFICE

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2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments regarding Statement of Reasons for Allowance".

3. Authorization for this amendment was given in a telephone interview with attorney James D. Stein (Reg. No. 63,782) on April 22, 2010. Additions to the claims are reflected by underline (example) and deletions are reflected by strikethrough (~~example~~).

**Title:** Vehicle Information Processing System for Content Recommendation  
Using Bayesian Network Models

**Abstract:**

An information processing system includes a content providing device (20) providing content appropriate for a user. The content providing device (20) includes: a model storage unit (40) containing a plurality of different models depending on the user attribute; a model determining unit (34) for selecting a model corresponding to the user attribute from the models stored in the model storage unit (40); a Bayesian reasoning unit (30) for reading out the model determined by the model determining unit (34) from the model storage unit (40) and using the read-out model to obtain the content appropriate for the user through probabilistic reasoning; and a recommending unit (22) for recommending the content obtained by the Bayesian reasoning unit (30) to the user. The content providing device (20) further includes a Bayesian learning unit (32) for learning models by using a user response to the content received from an operating unit (24). Thus, it is possible to accurately obtain and provide an appropriate recommendation.

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**Claim:**

1 - 5. (Canceled)

6. (Currently Amended) A vehicle information processing system for using a Bayesian network model to provide a probabilistically appropriate recommendation of media content to a recipient who receives the recommendation, the recipient being an occupant, the vehicle information processing apparatus comprising:

a model storage unit storing a plurality of different Bayesian network models corresponding to a plurality of recipients, the Bayesian network models providing probabilistically appropriate recommendations of media content to the recipients ~~depending~~ based on recommendation conditions;

a model selecting unit for selecting a first Bayesian network model from the stored Bayesian network models based on a recommendation condition associated with the recipient;

a reasoning unit for reading the ~~selected~~ first Bayesian network model from the model storage unit, and for obtaining a recommendation of media content using probabilistic reasoning associated with the read first Bayesian network model;

a recommendation unit for providing the recommendation of media content to the recipient;

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a response receiving unit for receiving a response ~~made by~~ from the recipient in response to the recommendation of media content;

a learning model information storage unit storing information associating learning models with corresponding Bayesian network models of the stored Bayesian network models; and

a model learning unit for:

identifying ~~[[a]] learning model~~ models associated with the ~~selected~~ first Bayesian network model based on the stored learning model information;

learning the identified learning ~~model~~ models based on the received response; and

updating the identified learning ~~model~~ models by specializing the identified learning ~~model~~ models for the recommendation condition associated with the recipient,

wherein the identified learning models ~~comprise among the models stored in the model storage unit, models identical to~~ include at least the first Bayesian network ~~models~~ model and a second Bayesian network model, different ~~models~~ from the first Bayesian network model, influenced by a result of the probabilistic reasoning associated with the read first Bayesian network model.

7. (Currently Amended) The vehicle information processing system according to claim 6, wherein

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the learning model information storage unit contains reflection parameters indicating a degree to which the response is reflected in the learning of the learning models, wherein each reflection parameter is set for each of a plurality of the learning models ~~corresponding to one of the Bayesian network models~~, and

the model learning unit performs learning processing such that a reflection parameter associated with a learning model is read from the learning model information storage unit and the response is reflected in the learning model to the degree according to the read reflection parameter.

8. (Currently Amended) A vehicle information processing system for using a Bayesian network model to provide a probabilistically appropriate recommendation of media content to a recipient who receives the recommendation, the recipient being an occupant, the vehicle information processing apparatus comprising:

a model storage unit storing a plurality of different Bayesian network models corresponding to a plurality of recipients, the Bayesian network models providing probabilistically appropriate recommendations of media content to the recipients ~~depending~~ based on recommendation conditions;

a model selecting unit for selecting a Bayesian network model from the stored Bayesian network models based on a recommendation condition associated with the recipient;

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a reasoning unit for reading the selected Bayesian network model<sub>i</sub> and for obtaining a recommendation of media content using probabilistic reasoning associated with the read Bayesian network model;

a recommending unit for providing the recommendation of media content to the recipient;

a response receiving unit for receiving a response of the recipient in response relation to the recommendation of media content;

a model learning unit for learning the stored Bayesian network models using the received response ~~and for updating~~ to specialize the learning models ~~to models specialized for~~ based on the recommendation condition associated with the recipient; ~~and~~

a learning data obtaining unit for obtaining learning data ~~used to bring for~~ generalizing the ~~specialized~~ learning models ~~closer to a general model, wherein the model learning unit uses the learning data to learn the learning models;~~ and

a learning reflection parameter storage unit storing learning reflection parameters indicating respective degrees to which the learning data is reflected in the learning of the learning models,

wherein the model learning unit uses the obtained learning data to learn the learning modes, such that the obtained learning data is reflected in learning of the learning models to the respective degrees indicated by the learning reflection parameters.

9. (Canceled)

10. (Currently Amended) The vehicle information processing system according to ~~claim 4~~ any one of claims 6 and 8, further comprising:

information recommending devices, each having the recommending unit; and  
a center device communicatively connected with the information recommending devices,

wherein the center device collects from each information recommending device the response received from the recipient when the recommendation of media content is provided.

11-12. (Canceled)

13. (Currently Amended) The vehicle information processing system according to any one of claims ~~[[1]] 6~~ and ~~[[9]] 8~~, wherein the system is provided in a car.

14-15. (Canceled)

4. Claims 6-8, 10 and 13 have been renumbered as 1-5.

## Reasons for Allowance

5. The following is an Examiner's statement for reasons for allowance.
6. Claims 6-8, 10 and 13 are considered allowable since when reading the claims in light of the specification, as per MPEP § 2111.01, In re Donaldson Co., Inc., 29 USPQ 2d 1845, 1850 (Fed. Cir. 1994), none of the references of record alone or in combination disclose or suggest the combination of limitations specified in the independent claims 6 and 8, including, at least the limitation of:  
in claim 6,  
    "...a model selecting unit for selecting a first Bayesian network model from the stored Bayesian network models based on a recommendation condition associated with the recipient",  
    "... identifying learning models associated with the first Bayesian network model based on the stored learning model information" and  
    "... wherein the identified learning models include at least the first Bayesian network model and a second Bayesian network model, different from the first Bayesian network model, influenced by a result of the probabilistic reasoning associated with the first Bayesian network model",  
and  
in claim 8,  
    "... a model selecting unit for selecting a Bayesian network model from the stored Bayesian network models based on a recommendation condition associated with the recipient",



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“... a learning data obtaining unit for obtaining learning data used to bring for generalizing the specialized learning models closer to a general model, wherein the model learning unit uses the learning data to learn the learning models”, and

“... a learning reflection parameter storage unit storing learning reflection parameters indicating respective degrees to which the learning data is reflected in the learning of the learning models, wherein the model learning unit uses the obtained learning data to learn the learning modes, such that the obtained learning data is reflected in learning of the learning models to the respective degrees indicated by the learning reflection parameters”.

### Support for Amendments to Claims:

The above limitations recited in, at least, claims 6 and 8 is supported at least in paragraphs [0074]-[0076], [0084] (Fig 2), for selecting a Bayesian network model, paragraphs [0077], [0087], [0097]-[0099] (Figs 5, 8), for identifying learning model, paragraphs [0100]-[0102], [0106], for model generalization, and paragraphs [0097]-[0099], [0102], [0105] (Fig 8), for reflection parameter in learning, of the originally filed disclosure.

## Correspondence Information

7. Any inquires concerning this communication or earlier communications from the examiner should be directed to LiWu Chang, who may be reached Monday through Thursday, between 5:00 a.m. and 6:00 p.m. EST. or via telephone at (571) 270-3809 or facsimile transmission (571) 270-4809 or email [li-wu.chang@uspto.gov](mailto:li-wu.chang@uspto.gov). If you need to send an Official facsimile transmission, please send it to (571) 273-8300. If attempts to reach the examiner are unsuccessful the Examiner's Supervisor, Donald Sparks, can be reached at (571)272-4201. Hand-delivered responses should be delivered to the Receptionist @ (Customer Service Window Randolph Building 401 Dulany Street, Alexandria, VA 22313), located on the first floor of the south side of the Randolph Building.

Finally, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Moreover, status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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Private PAIR system, contact the Electronic Business Center (EBC) toll-free @ 1-866-217-9197.

/L. C./  
Examiner, Art Unit 2129  
April 29, 2010

/Donald Sparks/  
Supervisory Patent Examiner, Art Unit 2129